

VAN DE NIEUWELAAR et al. -- 10/665,351
Client/Matter: 081468-0305843

REMARKS

Claims 1, 3-13 and 18-21 are pending. By this Amendment, the specification is amended; claims 14-17 are cancelled without prejudice or disclaimer; and claims 18-21 are added. Reconsideration in view of the above amendments and following remarks is respectfully requested.

Entry of this Amendment is proper under 37 C.F.R. §1.116 as the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not present any issues that will require further consideration and/or search as the amendments merely amplify issues discussed throughout the prosecution and no amendments are made to independent claims 1 and 6, (c) do not add any additional claims without canceling a corresponding number of claims; and (d) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented as they are in response to the new grounds of rejection entered in the Final Rejection and the arguments presented in the Final Rejection. Entry of the Amendment is respectfully requested.

Claims 14-17 were rejected under 35 U.S.C. §102(b) over Taniguchi et al. (EP 1041357 A1) or Kwan et al. (U.S. Patent Application Publication No. 2001/0004150 A1), or Lin (U.S. Patent 5,717,064). Claims 14-17 have been cancelled without prejudice or disclaimer, thus rendering moot the rejection.

Claims 1 and 3-17 were rejected under 35 U.S.C. §102(e) over Hayashi (U.S. Patent 6,426,790). The rejection is respectfully traversed.

Hayashi does not disclose or suggest a lithographic projection apparatus including, *inter alia*, a displacement measuring system to measure displacements of first and second substrate tables in first and second stations, wherein the displacement measuring system is configured to continuously measure displacements of the first and second substrate tables in at least two directions during transfer between the first and second stations.

As shown in Figure 2 of Hayashi, the wafer stage WS2 is shown in the exposure station being subjected to the exposure sequence. The wafer stage WS1 is shown in the replacement/alignment station being subjected to the replacement/alignment sequence. As disclosed in column 9, lines 34-39, the interferometer 16 and 18 receive reflected light from the mobile mirrors 20 and 22 on the wafer stages WS1 and WS2, respectively, to thereby measure the relative displacement from the reference position on each reflecting surface, and

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to measure the position in the X axis direction of the wafer stages WS1 and WS2. However, there is no disclosure or suggestion by Hayashi of continuously measuring the displacements of the wafer stages WS1 and WS2 in at least two directions, or even in the X direction, during the transfer between the first and second stations. In other words, when the wafer stage WS2 is moved out of the exposure station and the wafer stage WS1 is moved from the replacement/alignment station to the exposure station, there is no disclosure or suggestion by Hayashi of measuring the displacement of the wafer stage WS1 as it leaves the range of the interferometer 16 and prior to its entering the range of interferometer 18. Hayashi thus does not disclose or suggest continuously measuring the displacement of the first and second substrate tables in at least two directions during transfer between the first and second stations.

As disclosed, for example, in paragraph [0040] of the instant application, when the substrate table WTa arrives in the exposure station 2, its accurate position is known because its displacement has been continuously tracked by the interferometers 6, 8, 14, 15, 16. Thus, there is no need for an initial zeroing step.

Hayashi discloses in column 14, lines 19-32, that parallel processing is performed by use of the two wafer stages WS1 and WS2. The positional control of the wafer stage WS2 during the exposure operation is performed based on the measurement value of the length measuring axes BI2X and BI3Y of the interferometers 18 and the unillustrated Y interferometer for the BI3Y axis (see column 9, lines 15-17 of Hayashi). The positional control of the wafer stage WS1 where the wafer replacement and alignment operation are performed is conducted based on the measurement value of the length measuring axes BI1X and BI4Y of the interferometers 16 and the unillustrated Y interferometer for the BI4Y axis (see column 9, lines 15-17).

It is respectfully submitted that Hayashi's disclosure of position control of the wafer stage WS2 during the exposure operation would suggest to one of ordinary skill that Hayashi performs an initial zeroing step on the wafer stage WS2 when it arrives at the exposure station. This suggestion supports the conclusion that Hayashi does not continuously measure displacements of the wafer stages in at least two directions during transfer.

Claims 3-5 and new claims 18 and 20 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claim 1. In particular, new claim 18 recites a first interferometer associated with the first station, a second interferometer associated with the second station and a third interferometer between the first and second stations configured to measure displacements of the substrate table between the

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first and second stations in the first direction. As disclosed, for example, on page 10, paragraph [0037], for a period the displacement of the substrate table may be determined by both interferometers. This allows a seamless transfer of the measurement of displacement. Hayashi clearly does not disclose this third interferometer as recited in claim 18.

Hayashi also does not disclose or suggest transferring the first and second wafer stages WS1 and WS2 in a curved path as recited in claim 20. As disclosed, for example, on pages 10-11, paragraph [0038], by transferring the substrate tables in a curved path, collisions between the substrate tables are avoided. In addition, a seamless exchange between the interferometers is achieved.

Claim 6 recites a device manufacturing method including, *inter alia*, continuously measuring displacements of the first substrate table during transferring.

As discussed above, there is no disclosure or suggestion by Hayashi of continuously measuring displacements of a substrate table during transfer. Accordingly, Hayashi cannot anticipate or render obvious claim 6.

Claims 7-13, and new claims 19 and 21 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claim 6 and for the additional features recited therein. In particular, new claims 19 and 21 recite continuously measuring displacements of the first substrate table during transferring by measuring displacements of the first substrate table at a position intermediate the first and second stations and transferring the substrate tables in a curved path, which Hayashi clearly does not disclose or suggest.

Reconsideration and withdrawal of the rejection of claims 1 and 3-14 over Hayashi are respectfully requested.

Claims 1 and 3-17 were rejected under 35 U.S.C. §103(a) over Taniguchi et al. (EP 1041357 A1) in view of Hayashi. The rejection is respectfully traversed.

It is respectfully submitted that Taniguchi et al. fail to cure the deficiencies of Hayashi with respect to claims 1 and 3-14 discussed above and that the combination of Taniguchi et al. and Hayashi thus fails to include all the limitations of claims 1 and 3-14 and fails to present a *prima facie* case of obviousness. In particular, it is respectfully submitted that Taniguchi et al. also fail to disclose or suggest continuously measuring displacements of the first and second substrate tables in at least two directions during transfer between the first and second stations, as recited in claim 1, and continuously measuring displacements of the first substrate table during transfer as recited in claim 6.

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As discussed in the response filed September 29, 2004, the first embodiment of Taniguchi et al., shown in Figures 1-4, does not disclose first and second substrate tables. As also discussed in the September 29, 2004 response, although the second embodiment, shown in Figures 5-12 of Taniguchi et al., discloses the first and second substrate tables in first and second stations, it is respectfully submitted that there is no disclosure or suggestion of continuously measuring displacements, as recited in claims 1 and 6. For example, as shown in Figure 6, the system of Taniguchi et al. is essentially the same as that shown in Figure 2 of Hayashi.

Claims 3-5 and 7-13, and new claims 18-21 recite additional features of the invention and are allowable for the same reasons discussed above with respect to claims 1 and 6 and for the additional features recited therein. In particular, new claim 18 recites a third interferometer between the first and second stations configured to measure displacements of a substrate table between the first and second stations in the first direction. Neither Figure 2 of Hayashi nor Figure 6 of Taniguchi et al. disclose or suggest this feature. As another example, new claim 19 recites that continuously measuring the displacements comprises measuring displacements of the first substrate table at a position intermediate the first and second stations by a third interferometer and new claims 20 and 21 recite transferring the substrate tables in a curved path. None of these features are disclosed or suggested by either Hayashi or Taniguchi et al. and the combination of the two reference thus fails to include all the claim limitations and fails to present a *prima facie* case of obviousness.

Reconsideration and withdrawal of the rejection of claims 1 and 3-13 over Taniguchi et al. in view of Hayashi are respectfully requested.

In view of the above amendments and remarks, Applicant respectfully submit that all the claims are allowable and that the entire application is in condition for allowance.

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Should the Examiner believe that anything further is desirable to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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